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lots, from day to day or week to week. Or he makes a standing contract to have so or so many cases delivered at specified times.

Collecting of ferns starts in July, in the north. New crop ferns from the South come about the beginning of April. These are not stored in the freezer but are sold as soon as they arrive. Collecting lasts until the weather makes it impossible, in the fall. Summer ferns can not be stored for any great length of time and, in fact, the later the fronds are harvested, the better they will stand cold storage.

One New England firm stores about 40 million of Dagger and Fancy ferns every fall. Sometimes the waste is fearful, especially was this last winter an uncommonly bad one. No doubt, a large part or maybe the greatest part of this loss could be prevented by proper caution, but, it seems funny, nobody seems to give this aspect even a thought. All what the dealers will say is: "The fern trade is some speculation, my boy. You make money, if they don't spoil, and you lose a devil of a pile if they do, so what's the use."

I have no positive knowledge, but I believe that the fern collecting and trade is much more important in Chicago than in Boston. Also I believe it is much harder to find supplies of northern grown ferns out West than in the East and especially in New England. Cut ferns always command a third better price out West than they do here and the supply is exhausted a month or two before we begin to get to the bottom of the pile.

BOSTON, MASS.

THE BRACKEN AS A POISONOUS PLANT—Much interest has been aroused among the farmers of Western Oregon by the publication of Professor Wm. E. Lawrence's bulletin on "The Principal Stock-Poisoning Plants of Oregon" (Ore. Ag. Coll. Exp. Sta. Bull. 187, Corvallis,

Jan. 1922). Among the plants belonging to the criminal classes is enumerated the Western form of the common bracken (*Pteridium aquilinum* (L.) Kuhn, var. *pubescens* Underw.). A canvass of the farmers in my neighborhood discloses the fact that the majority had never thought of this fern as anything worse than a great nuisance as an inevitable component of the hay-crop. That it is an abundant and pestiferous weed is evident to the most casual traveller in the Northwest, and societies for its preservation would be about as popular as those in behalf of the diamond-back "rattler;" but that it is also capable of posing as an active poisoning agent has been by no means a matter of general belief. One reason for this may perhaps be found in the fact that stock almost never eat the plant in the green state; the young stalks, however, are esteemed as "greens" by the Indians, and I am informed are extensively eaten in Japan. While many farmers admit cases of poisoning resulting from some component of the hay, there is no agreement as to what it is; some think it is the wild carrot, others some species of vetch, and still others the St. John's wort. No one, however, seems to have undertaken any scientific experiment to isolate the cause of the trouble, and Prof. Lawrence's inclusion of the fern in his list of poisonous plants has met with a very qualified acceptance. The fact of its ability to cause serious physical disorder and even death seems, however, perfectly established by the experiments of Hadwen and Bruce, reported in Dept. of Agric. Canada, Health of Animals Branch Bull. 26 (Ottawa 1917), who by isolating horses and feeding them exclusively on hay containing not less than 20 per cent of bracken, found that after about a month in every case the animal either died or became so weakened that it had to be killed. The toxic principle has not been isolated, but seems to be a fixed oil, insoluble in water, such as is known to be present

in many ferns. That more loss is not caused in a region where the plant is so ubiquitous seems due to the fact that horses will refuse to eat it unless hard-pressed by a shortage of other food. Cattle are apparently not affected. Since it possesses a deep-seated horizontal rootstock, and is surprisingly drought-resistant during our long dry summers, the problem of its eradication is a formidable one, and will perhaps never be solved. In many parts of the Coast Range of Oregon the burnt-over mountain-sides are covered with an almost pure stand of bracken, extending unbroken as far as the eye can reach. It is doubtful if any fern in the Temperate Zone surpasses it in the number of individuals in a given area. In this connection it is interesting to note that although so hardy in other respects, the fronds are very sensitive to cold, and a mere touch of frost suffices to kill them where other vegetation is unscathed. The late frosts of the Middle West would have a very salutary effect in reducing the superabundance of bracken-foliage if they could be imported into our mild trans-Cascadian climate.—J. C. NELSON, SALEM, OREGON.

BOTRYCHUM OBLIQUUM, VAR. DISSECTUM IN VERMONT.

—I have read with much interest the notes on *Botrychium obliquum* var. *dissectum* which have appeared in the JOURNAL of late and I am moved to contribute my mite to the discussion.

I have never found either the species or the variety in any such numbers as Mr. Hopkins mentions on page 115 but rather I have found a few plants in a place here, there and everywhere; usually in an old field where the grass is somewhat run out, or else in an old pasture; in neither case the soil being much wet. Once, in Bethel, Maine, I found both growing on "cradle knolls" in a swale. In this same swale about the borders of other knolls, or hummocks, I collected *Ophioglossum vulgatum*.